

Rana Salem

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Experience

Junior Software Developer Jan 2024–present

Defra (Department for Environment, Food and Rural Affairs)

- Collaborated in multidisciplinary teams, leveraging agile ways of working using Jira, ADO (Azure DevOps), and Kandan daily.
- Led major migrations of multiple legacy and modern systems from Microsoft Azure to AWS, resolving outdated practices to align with Defra's current coding standards e.g. use of ES6 modules and neostandard linting.
- Delivered scalable, secure, user-centred Node.js services using Hapi.js, PostgreSQL, Liquibase, MongoDB; built REST, event-driven, and GraphQL APIs aligned to OpenAPI and AsyncAPI standards.
- Built critical service features including a centralised communications microservice and optimised database query performance through indexing of commonly searched fields.
- Designed and deployed containerised applications using Docker, Kubernetes, Helm, AWS ECS; independently supported CI/CD workflows and completed production deployments.
- Strengthened service quality and security by implementing shift-left testing via performance/journey test suites (JMeter, Playwright, BrowserStack), strong CSP controls, and accessibility compliant interfaces using GDS (Government Design System).
- Mentored and onboarded software developers at all levels (junior, senior, lead), created bespoke learning and onboarding guides to promote smooth integration and a collaborative engineering culture within the department.

IT Consultant Apr 2023–present

FDM Group

- Contracted to the Department for Environment, Food and Rural Affairs) as a Node.js developer; contributed to the development of several live services and the modernisation and migration of legacy systems.
- Earned the Microsoft Azure Fundamentals (AZ-900) certification, validating cloud fundamentals knowledge across client placements and internal proof of concept projects.
- Awarded FDM's accredited Tech Industry Gold Foundation Credential in Software Development for proficiency in Java, SQL, Unix, HTML, CSS, Spring Boot, Microservices, REST APIs, React, JavaScript, and Git.

Laboratory Demonstrator 2022–2023

Glasgow Caledonian University

- Excelled as a teaching assistant, mentoring final year undergraduates and PhD candidate, demonstrating the use of advanced laboratory equipment for independent research.
- Prioritised safety by enforcing health and safety measures in the laboratory, fostering a secure and safe learning environment.

Royal Society of Chemistry (RSC) Research Enablement Scholarship May–Aug 2022

Glasgow Caledonian University & University of Glasgow

- Explored effects of conservation protocols on historic textile artefacts using AFM (Atomic Force Microscopy), SEM (Scanning Electron Microscopy), and fluorescence spectroscopy.
- Presented as poster and flash talk at the Microscience Microscopy Congress (MMC2023).

Postgraduate Research Intern (PUBLISHED)

Jul–Sep 2021

Glasgow Caledonian University & University of Glasgow

- Investigated effects of textile cleaning on historic cotton textiles using advanced instrumentation: AFM and UV/Vis (Ultraviolet/Visible) spectroscopy.
- The research was published in the peer-reviewed Heritage Science journal.

Royal Microscopical Society (RMS) Summer Studentship (PUBLISHED) Jun–Aug 2020

Glasgow Caledonian University & University of Glasgow

- Analysed textile fibres pre- and post-cleaning with established conservation protocols via optical and stereomicroscopy.
- Published findings in Infocus Magazine, featured a poster at the Microscience Microscopy Congress (MM2021), and delivered a local presentation to staff and students from the RMS and partner universities.

Projects

Personal Website • ranasalem.io • github.com/rtasalem/ranasalem.io

- **Summary:** My personal portfolio and website where I share my career history, projects, and publish to my blog on interesting and engaging topics in tech and software development.
- **Role:** Frontend developer and maintainer
- **Tech stack:** TypeScript, Next.js 15, DaisyUI, Contentlayer, MDX (Markdown + JSX)

Busgres • npmjs.com/package/busgres • github.com/rtasalem/busgres

- **Summary:** Busgres is a Node.js package that will receive a message from Azure Service Bus queues/topics and writes the data into a PostgreSQL database. Configurable with a single client.
- **Role:** Developer and maintainer
- **Tech stack:** JavaScript, Node.js, NPM, Azure Service Bus, PostgreSQL

Bin It! • github.com/rtasalem/bin-it

- **Summary:** Python application that will scrape local council bin collection calendar and send email alerts a day in advance for when bins are due to be collected.
- **Role:** Developer and maintainer
- **Tech stack:** Python, MongoDB, Docker, Docker Compose, Web scraping (Beautiful Soup)

Take A Bao Website • takeabao.framer.website

- **Summary:** An official website built using Framer for a close friend's small business; a pop-up food stall and fundraising platform. The website makes use of an easy-to-use contact form where visitors to the site can send queries and make custom food orders.

- **Role:** Designer and maintainer
- **Skills:** Framer software, UI/UX design, web design, responsive layouts

Barbie E-commerce Website • github.com/rtasalem/barbie-e-commerce-website

- **Summary:** Barbie themed e-commerce website submitted as a final project after 14 weeks of intensive training as a software developer at FDM Group.
- **Role:** Backend developer (in a team of 7)
- **Tech stack:** Java, Spring Boot, REST API, H2 database, JUnit, Mockito, JavaScript, React, HTML, CSS

Take A Bao Shop Menu • github.com/rtasalem/take-a-bao-shop-menu

- **Summary:** Prototype of a read-only online menu for a pop-up food stall and fundraising platform. Early concept to support a close friend's small business.
- **Role:** Full stack developer
- **Tech stack:** Java, Spring Boot, REST API, H2 database, Postman, JavaScript, React, HTML, CSS

Education

Master of Science with Merit, Forensic Science **2021–2022**

University of Strathclyde, MSc (Glasgow, Scotland)

- **Dissertation:** Are Established Bleaching Practices in Textile Conservation Damaging Historic Treasures? A Microscopic and Spectroscopic Investigation.

Bachelor of Science with 1st Class Honours, Forensic Investigation **2017–2021**

Glasgow Caledonian University, BSc (Hons) (Glasgow, Scotland)

- **Dissertation:** Analysis of the Effect of Conservation Bleaching Methods on Historic Textiles.

Erasmus+, Degree Programme in Laboratory Sciences **Aug–Dec 2019**

Metropolia University of Applied Science (Helsinki, Finland)

- A semester spent as an exchange student in Helsinki, Finland.

Publications & Presentations

PUBLICATIONS*

Salem, R.T.A., Thompson, K., Uttamlal, M. *Bleaching cotton in textile conservation: a closer look using atomic force microscopy.* Heritage Science. 2022;10:195. <https://doi.org/10.1186/s40494-022-00830-2>.

Salem, R. *RMS Summer Studentship Report: Microscopic Analysis of Historic Textile Fibres Pre- and Post-Cleaning.* Infocus Magazine: Proceedings of the Royal Microscopical Society. 2020;60:32–35. <https://doi.org/10.22443/rms.inf.1.194>.

*All publications can be verified on ORCID: orcid.org/0000-0002-8683-561X.

PRESENTATIONS

Microscience Microscopy Congress (MMC2023) Jul 2023

Salem, R.T.A., Thompson, K., Uttamlal, M. *Microscopic Analysis of New and Historic Cotton Fibre Cross-Sections*. Microscience Microscopy Congress 2023. Manchester Central Convention Complex (Manchester, England).

Microscience Microscopy Congress (MMC2021) Jul 2021

Salem, R., Uttamlal, M., and Thompson, K. *Microscopic analysis of new and historic cotton textiles pre- and post-bleaching*. Microscience Microscopy Congress 2021. Poster abstract: <https://www.mmc-series.org.uk/mmc2021/abstract/microscopic-analysis-of-new-and-historic-cotton-textiles-pre-and-post-bleaching.html>.

Microscopic Analysis of Historic Textile Fibres Pre- and Post-Cleaning Oct 2020

Royal Microscopical Society Summer Studentship 2020. Glasgow, Scotland.

Professional Development

- Microsoft Azure Fundamentals (AZ-900) Certification (Microsoft) Oct 2023
- Tech Industry Gold Credential: Software Development (TechSkills) Jul 2023

Awards & Achievements

- Royal Society of Chemistry Research Enablement Grant (£10,000) May–Aug 2022
- GCU Mitigation Reboot Fund (£5000) Jul–Sep 2021
- University of Strathclyde Faculty of Science Masters Scholarship (£1000) Mar 2021
- Royal Microscopical Society Summer Studentship (£2000) Jun–Aug 2020
- Bronze Duke of Edinburgh's Award Nov 2016

Interests

Outside of work, I enjoy reading and try to educate myself on a wide range of topics. I'm also passionate about writing and often do research to aid writing for my blog. Coding is a hobby of mine in and outside of business hours. I get fulfilment from contributing to and developing open-source projects and I'm usually on the lookout for any tasks that I can automate through some manner of scripting. I'm currently building my own CI/CD workflows and pipelines using tools such as Docker, K8s, Helm, Microsoft Azure, Drone CI, Snyk, and SonarQube Cloud. I'm also building my own homelab to self-host a variety of applications I'm developing and use often. To make sure all my hobbies don't require me to sit at a desk, I enjoy going to the gym, getting my steps in, swimming, and taking my camera out for some amateur photography.